

Amendment and Response

Applicant: Joseph M. Torgerson et al.

Serial No.: 10/827,030

Filed: April 19, 2004

Docket No.: 200210152-1

Title: FLUID EJECTION DEVICE

REMARKS

The following Remarks are made in response to the Non-Final Office Action mailed April 6, 2006, in which claims 1-63 were rejected.

With this Amendment, claims 51-55 and 58-63 have been cancelled without prejudice, and claims 1, 4, 5, 8-19, 21, 22, 24-27, 29, 30, 35, 36, 39-50, and 56 have been amended to clarify Applicant's invention.

Claims 1-50 and 56-57, therefore, remain pending in the application and are presented for reconsideration and allowance.

Claim Objections

The numbering of the claims has been objected to as not being in accordance with 37 CFR 1.126.

As there were two claims numbered 37, the second misnumbered claim 37 has been renumbered as claim 38. Thus, originally numbered claims 38-62 have been renumbered as claims 39-63, respectively, and the dependency therefrom renumbered accordingly. Applicant, therefore, respectfully requests that the objection to the claims be reconsidered and withdrawn.

Claim Rejections under 35 U.S.C. § 102 and 35 U.S.C. § 103

Claims 1, 2, 4, 8, 9, and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Bhaskar et al. US Patent No. 5,808,640.

Claims 35-55, 62, and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Cleland et al. US Patent No. 6,491,377.

Claims 3, 5-7, 10-19, and 25-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhaskar et al. US Patent No. 5,808,640 in view of Cleland et al. US Patent No. 6,491,377.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhaskar et al. US Patent No. 5,808,640 in view of Chen et al. US Patent Application No. 2002/0135640.

Claims 58-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cleland et al. US Patent No. 6,491,377 in view of Axtell et al. US Patent Application No. 2002/0093551.

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With this Amendment, claims 51-55 and 58-63 have been cancelled without prejudice. The rejection of these claims, therefore, is rendered moot.

With this Amendment, independent claim 1 has been amended to clarify that the fluid ejection device includes a substrate; a first fluid feed slot formed in the substrate and having a first fluid feed slot edge; first firing resistors disposed along the first fluid feed slot and configured to respond to a first current to heat fluid provided by the first fluid feed slot via a fluid path; and a reference conductor formed on the substrate and configured to conduct the first current from the first firing resistors, wherein the reference conductor is disposed under the fluid path in an area between the first fluid feed slot edge and the first firing resistors.

With this Amendment, independent claim 22 has been amended to clarify that the fluid ejection device includes a substrate; a first fluid feed slot formed in the substrate and having a first fluid feed slot edge; first vaporization chambers fluidically coupled to the first fluid feed slot via a fluid path; a reference conductor formed on the substrate and disposed under the fluid path in an area between the first vaporization chambers and the first fluid feed slot edge; and an isolation structure configured to isolate the reference conductor from fluid flowing over the first fluid feed slot edge to the first vaporization chambers.

With this Amendment, independent claim 35 has been amended to clarify that the fluid ejection device includes a substrate; a first fluid feed slot formed in the substrate and having a first fluid feed slot edge; first firing resistors disposed along the first fluid feed slot and configured to respond to a first current to heat fluid provided by the first fluid feed slot via a fluid path; first drive switches disposed along the first fluid feed slot, wherein each of the first drive switches is electrically coupled to one of the first firing resistors and configured to supply the first current to the one of the first firing resistors; and a reference conductor formed on the substrate and disposed over a portion of the first drive switches and under the fluid path in an area between the first firing resistors and the first fluid feed slot edge, wherein the reference conductor is configured to conduct the first current from the first firing resistors.

With this Amendment, independent claim 43 has been amended to clarify that the method of operating a fluid ejection device includes receiving fluid via a fluid path at first firing resistors disposed along a first fluid feed slot formed in a substrate, the first fluid feed slot having a first fluid feed slot edge and the fluid path extending between the first fluid feed

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slot edge and the first firing resistors; receiving a first current at the first firing resistors; heating the fluid received from the first fluid feed slot in response to receiving the first current at the first firing resistors; receiving the first current from the first firing resistors at a reference conductor formed on the substrate under the fluid path in an area between the first fluid feed slot edge and the first firing resistors; and conducting a first part of the first current through the reference conductor as disposed between the first fluid feed slot edge and the first firing resistors.

With this Amendment, independent claim 56 has been amended to clarify that the fluid ejection device includes a substrate; a first fluid feed slot formed in the substrate; first vaporization chambers fluidically coupled to the first fluid feed slot via a fluid path; and a reference conductor disposed under the fluid path in an area between an edge of the first fluid feed slot and the first vaporization chambers.

With respect to the Bhaskar et al., Cleland et al., and Chen et al. references, Applicant submits that these references, individually or in combination, do not teach or suggest a fluid ejection device as claimed in independent claim 1 including, amongst other things, a reference conductor formed on the substrate and configured to conduct the first current from the first firing resistors, wherein the reference conductor is disposed under the fluid path in an area between the first fluid feed slot edge and the first firing resistors, do not teach or suggest a fluid ejection device as claimed in independent claim 22 including, amongst other things, a reference conductor formed on the substrate and disposed under the fluid path in an area between the first vaporization chambers and the first fluid feed slot edge, do not teach or suggest a fluid ejection device as claimed in independent claim 35 including, amongst other things, a reference conductor formed on the substrate and disposed over a portion of the first drive switches and under the fluid path in an area between the first firing resistors and the first fluid feed slot edge, wherein the reference conductor is configured to conduct the first current from the first firing resistors, do not teach or suggest a method as claimed in independent claim 43 including, amongst other things, receiving the first current from the first firing resistors at a reference conductor formed on the substrate under the fluid path in an area between the first fluid feed slot edge and the first firing resistors, and conducting a first part of the first current through the reference conductor as disposed between the first fluid feed slot edge and the first firing resistors, and do not teach or suggest a fluid ejection device

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as claimed in independent claim 56 including, amongst other things, a reference conductor disposed under the fluid path in an area between an edge of the first fluid feed slot and the first vaporization chambers.

In view of the above, Applicant submits that independent claims 1, 22, 35, 43, and 56 are each patentably distinct from the Bhaskar et al., Cleland et al., and Chen et al. references and, therefore, are each in a condition for allowance. Furthermore, as dependent claims 2-21 further define patentably distinct claim 1, dependent claims 23-34 further define patentably distinct claim 22, dependent claims 36-42 further define patentably distinct claim 35, dependent claims 44-50 further define patentably distinct claim 43, and dependent claim 57 further defines patentably distinct claim 56, Applicant submits that these dependent claims are also in a condition for allowance. Applicant, therefore, respectfully requests that the rejection of claims 1, 2, 4, 8, 9, 21-24, 35-55, 62, and 63 under 35 U.S.C. 102(b) and the rejection of claims 3, 5-7, 10-19, 20, 25-34, and 58-61 under 35 U.S.C. 103(a) be reconsidered and withdrawn, and that claims 1-50 and 56-57 be allowed.

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CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1-50 and 56-57 are all in a condition for allowance and requests reconsideration of the application and allowance of all pending claims.

Any inquiry regarding this Amendment and Response should be directed to either James R. McDaniel at Telephone No. (858) 655-4157, Facsimile No. (858) 655-5859 or Scott A. Lund at Telephone No. (612) 573-2006, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

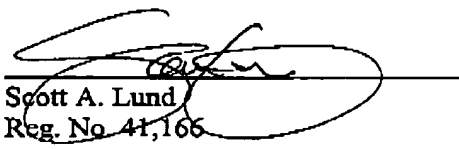
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Respectfully submitted,

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being facsimile transmitted to the United States Patent and Trademark Office, Fax No. (571) 273-8300 on this 6th day of July, 2006.

By 
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